

Abstract Submitted
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Electrostatic Dust Detection and Removal in Tokamaks¹ R. HENSLEY, Embry-Riddle Aeronautical University, C.H. SKINNER, A.L. ROQUEMORE, Princeton Plasma Physics Laboratory — The inventory of in-vessel dust particles in next-step tokamaks will increase with the rise in stored energy and pulse duration. Dust levels will need to be measured and controlled for safety reasons and to avoid plasma contamination. A novel electrostatic dust detector has been developed with a sensitivity appropriate for the carbon dust levels expected in next-step devices.^{2,3} Higher sensitivity is desired for real-time measurements in contemporary tokamaks that have less dust. We report on results from a larger area, more sensitive detector. A 2" x 2" circuit board has two interlocking combs of copper traces spaced by 25 microns and biased at 30-50 V. The carbon test dust is delivered to the circuit board by a mesh tray vibrated at 60 Hz. The impinging dust creates a short circuit and the resulting current pulse is recorded. We will present results on the dust detection sensitivity and dust removal efficiency of these new detectors in three environments: air, vacuum, and inert gas.

² C. Voinier *et al.*, J. Nucl. Mater. 346 (2005) 266-271.

³ C. Parker *et al.*, PPPL Report, PPPL-4169.

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